

REMARKS

Claims 27-50 are pending in the application. By this Amendment, claims 27, 29, 33, 34, 36, 41, 43, 44, and 47-49 are amended; claims 28, 30, 37, 38, and 46 are cancelled; and claims 51-60 are newly presented. Applicants request reconsideration and allowance in view of the above amendments and the following remarks.

Specification

The specification is amended to correct a further typographical error entered by way of the previous amendment when attempting to correct the original, obvious typographical error (fiber length is necessarily greater than fiber width, so “ μm ” for length (in original) clearly should have been “mm”). No new matter is presented.

Rejection Under 35 U.S.C. § 112

Claim 38 is rejected under 35 U.S.C. § 112, second paragraph, for an antecedent basis issue. Claim 38 is cancelled. Therefore, the rejection is moot, and Applicants request that it be withdrawn.

Rejections Under 35 U.S.C. § 102

Claims 30 (independent), 33 (independent), and 35 are rejected under 35 U.S.C. § 102(b) as anticipated by Sobolev, U.S. 5,030,488. To the extent claim 30 is cancelled, the rejection is moot. Otherwise, Applicants traverse the rejection and request that it be withdrawn.

Even before the present amendment, claim 33 – and therefore claim 35, which depends from it – specified “locally applying the mixture [of fibers and resin] only onto predetermined areas of the at least one first and the at least one second cover sheet (1, 2[as amended]) in the form of a pattern[.]” (The present amendment clarifies that the pattern comprises cavities or channels which remain free of the mixture of fibers and adhesive, or is in the form of a non-continuous layer comprising islands of the mixture of fibers and adhesive[.]”) Sobolev discloses no such pattern. Rather, to the contrary, Sobolev refers several times to applying the resin/reinforcement uniformly and/or evenly across the sheet to which it is being applied. See, in

particular, column 8, lines 36-38 (“Uniform deposition on the moving sheet is achieved by having the spray head traverse back and forth across the width of sheet 5 on an automatic reciprocator unit[]”); column 8, lines 47-50 (“In tests with commercial airless medium-pressure spray equipment (500 to 700 psi at the pump discharge), the core mixture was deposited evenly and without any entrapped air[]”); and column 17, lines 22-26 (“The freshly catalyzed resin mixture, prepared as described above, was then evenly spread on the bottom facing between the inserts, making certain that the top surfaces of the inserts remained clean and dry[]”).

Furthermore, claim 33 specifies that locally varying physical properties of the structure are obtained by locally applying the mixture of fibers and adhesive only onto the pattern-forming predetermined areas. Sobolev does not disclose that feature of the claim, either. Rather, to the contrary, Sobolev teaches that the resin composition itself should be changed to obtain the desired physical properties. See, for example, column 11, lines 6-25 (emphasis added):

As is the case in resin formulating resins in many other uses, the desired properties are often competing and mutually exclusive and in order to achieve the desired overall characteristics of the laminate, a compromise or balance of particular properties is necessary. Following the examples and disclosure contained herein, one skilled in the art will be able to select, formulate and test the resin desired for a particular structural laminate to easily determine if a particular resin is useful for a particular application and will provide a laminate having characteristics according to this invention. In the event the desired characteristics for the laminate are not achieved initially with a particular resin, one skilled in the art, following the teaching of the disclosure herein, will be able to reformulate the resin to adjust the desired properties of the resin or change the surface preparation in order to provide the desired laminate having the characteristics of the laminates of this invention.

See, also, column 28, lines 55-64 (emphasis added):

The performance of particular resins in the laminate of this invention is somewhat unpredictable, as indicated above. As in other applications requiring materials with complex combinations of properties, the effectiveness [sic] of candidate resins will have to be determined experimentally, that is, by preparing laminates and subjecting them to the above-mentioned and other appropriate performance tests to determine which resin or resin system gives the desired performance characteristics and properties according to this invention.

Thus, Sobolev does not anticipate (or even suggest) the invention recited in claims 33 and 35. Accordingly, Applicants traverse the rejection and request that it be withdrawn.

Claims 46 (independent) and 47 are also rejected under 35 U.S.C. § 102(b) as anticipated by Sobolev. To the extent claim 46 is cancelled, the rejection is moot. Otherwise, Applicants traverse the rejection.

Claim 47 previously depended from claim 46. Because claim 46 was cancelled, claim 47 was amended to depend from claim 27 (which, Applicants submit, is allowable for reasons explained below). Regardless of its particular base claim, however, claim 47 is not anticipated by Sobolev. In particular, claim 47 specifies that the structure includes channels (in the adhesive, as per claim 27) that are suitable for guiding liquid or gaseous media. Sobolev discloses no such channels. Rather, to the contrary, Sobolev advocates uniform and/or even application of the resin/reinforcement mixture, as addressed above, and such uniform/even application of the mixture presumably would yield no channels.

With respect to claim 46 (which recited applying a non-continuous layer of adhesive to areas on one of the cover sheets), citing to the Abstract; column 8, lines 17-22; column 11, lines 38-61; and Figures 1A and 1B of Sobolev, the Examiner asserts that

Sobolev teaches a method for producing laminates comprising two metal sheets with fibrous core made of metallic fibers. Before the two sheets are joined together, one cover sheet is applied in certain areas with a mixture of adhesive and fibers by a spray nozzle; therefore the adhesive layer is non-continuous[.]

Applicants respectfully submit that the Examiner is mistaken in that regard. Nothing in Sobolev – either in the passages cited by the Examiner or elsewhere – suggests that the resin/fiber mixture be applied “in certain areas,” i.e., non-continuously. Given Sobolev’s repeated disclosure of uniform/even application of the mixture, Sobolev simply does not disclose (or even suggest) that feature; given the fact that claim 46 is cancelled, however, that error is moot.

With respect to claim 47, on the other hand, the Examiner does not say anything specific at all. Accordingly, Applicants rely on the distinction noted immediately above to traverse the rejection, and they request that the rejection be withdrawn.

Rejections Under 35 U.S.C. § 103

Claims 27 (independent), 28, 29, 38, 40, and 50 are rejected under 35 U.S.C. § 103(a) based on Anderson et al., U.S. 3,684,637, in view of Sobolev. The Examiner cites Anderson for a laminating process in which fibers and adhesive are applied to a cover sheet, with fibers of different kinds being applied from a flock supply and with the adhesive allegedly being supplied so as to create a pattern on the cover sheet. The Examiner cites to Sobolev for its disclosure of applying metallic fibers to metallic cover sheets. Apparently, the Examiner's position is that it would have been obvious to modify Anderson to use metallic fibers instead of flock and to use metallic cover sheets to "provide improved structural strength compared to laminates of the prior art, while also useful in decorative and protective applications[.]"¹ To the extent claims 28 and 38 are cancelled, the rejection is moot. Otherwise, Applicants traverse it for at least two reasons.

First, the combination of references does not yield the claimed invention. In particular, contrary to the Examiner's assertion, Anderson does not disclose applying the adhesive in a pattern. In Anderson, the laminate outer skin 19 is formed from film-forming resin dispersion 12, which is metered onto carrier 11 and forms a continuous film. See column 2, lines 37-65 (line 56 in particular). The fabric backing sheet 40 for the laminate, on the other hand, is fed from roll 41 and passes through an "adhesive solution applying-combination," where "an overall continuous film 48 of the adhesive solution 42" is applied to the backing sheet. See column 3, lines 16-25 (emphasis added). Flocking material is applied continuously and substantially uniformly to the wet adhesive; the flocked backing sheet is joined to the laminate outer skin; and the laminated structure is passed through oven 31. See column 1, lines 55-56 and column 3, lines 26-59. Nothing in that amounts to disclosure of applying adhesive, or a mixture of fibers and adhesive, in a pattern. Nor does Sobolev disclose applying adhesive, or a mixture of fibers and adhesive, in a pattern, as explained above. Therefore, the combination of references does

¹ The Examiner's articulation of a rationale for combining the references appears to be an incomplete or improperly concatenated thought. What the Office Action actually states is that "[h]owever, Sobolev teaches applying metallic fibers, as an alternative to organic fibers, to metallic cover sheets, as it would provide improved structural strength compared to laminates of the prior art, while also useful in decorative and protective applications (column 1, lines 15-19; column 11, lines 58-62).

not yield the claimed invention, so the Examiner has failed to set forth a *prima facie* case of obviousness.

Second, contrary to the Examiner's assertion, one of skill in the art would not have been motivated to modify Anderson to incorporate metallic fibers or, more importantly, metal backing sheets in the manner the Examiner suggests. Anderson is directed to making sheets of faux or simulated leather material, which is "useful in many applications such as for shoe body leathers, making belts, ladies' handbags, zipper briefcases, other carrying cases and luggage articles, and various articles of wearing apparel." See column 1, lines 14-21 (Abstract) and lines 42-46; and column 3, lines 70-75. Clearly, metallic backing sheets would be inappropriate for such applications. Furthermore, Anderson is replete with reference to the various constituent layers of the laminated product, as well as the final product itself, being pliable or flexible.² Accordingly, the improved structural strength provided by metal backing sheets on which the Examiner relies as justification for modifying Anderson is simply inapposite to Anderson; therefore, one of skill in the art would not have so modified Anderson. Thus, for that reason, too, the Examiner has failed to set forth a *prima facie* case of obviousness.

Accordingly, Applicants traverse the rejection and request that it be withdrawn.

Claims 31 (independent) and 32 are rejected under 35 U.S.C. § 103³ based on Sobolev in view of Tsiarkezos et al., U.S. 6,821,601. The Examiner cites Sobolev for the general claim-recited features relating to manufacturing a composite layer structure. The Examiner acknowledges that "Sobolev does not teach fixing fibers by stitch welding."⁴ However, according to the Examiner, it would have been obvious to do so because "Tsiarkezos et al. teach

² The terms "pliable" and "flexible" are used at least thirty-three times throughout the specification and the claims of Anderson.

³ The Examiner indicates in the Office Action that those two claims are rejected under 35 U.S.C. § 102(b). The substance of the rejection makes clear, however, that they are actually being rejected under 35 U.S.C. § 103.

⁴ It should be noted that the claim recites "inductive stitch welding," not just "stitch welding."

stitch bonding^{15]} metallic fibers to a metal foil, to ensure the fibers' firm adherence to the metal foil, and heat treating the composite, after applying the fabrics, to stabilize dimensions of the fabric[.]” Applicants traverse the rejection because the Examiner has either misread or misunderstood the claim and, as a result, cited a reference (Tsiarkezos) that does not disclose the feature (inductive stitch welding) for which the Examiner relies on it.

Paragraph [113] of the application explains as follows:

[0113] Furthermore, it is possible to fix the metallic fibers 9 by an inductive stitch welding directly onto the metal foil 1. For this purpose, a substrate is applied onto the first metal foil 1 into which the fibers 9 can easily penetrate during the flocking process so that they are fastened. At next the first metal foil 1 is inductively heated. By an appropriate selection of the conductivity of the substrate a specific heating of the transition between the first metal foil 1 and the fibers 9 is achieved so that both are welded to each other. In the same manner or in a manner as explained above, the second metal foil 2 is applied.

Tsiarkezos discloses nothing of the sort. By way of background, Tsiarkezos explains as follows (column 1, lines 15-54):

Stitchbonded nonwoven fabrics and processes and machines for making such fabrics are known. Typically, stitchbonded nonwoven fabrics are made by multi-needle stitching a fibrous material with one or more stitching thread systems. Typically, the material consists of substantially nonbonded fibers, although material consisting of bonded fibers also has been used. The stitching threads form patterns of stitches in the fibrous material. Many different kinds of fibrous materials have been employed to produce stitchbonded fabrics, including carded webs, thin felts, spunlace fabrics, spunbonded nonwoven sheets, paper and the like. These known fibrous layers are made from various natural and synthetic organic staple fibers or continuous filaments.

Known processes for making stitchbonded fabrics typically include the steps of (a) feeding a fibrous material to a stitchbonding machine; (b) threading a multi-needle bar of the stitchbonding machine with stitching threads; (c) inserting the stitching thread into the fibrous material to form a pattern of spaced apart, interconnected rows of stitches, thereby creating the stitchbonded fabric; (d) removing the stitchbonded fabric from the stitchbonding machine; and (e) optionally subjecting the stitchbonded fabric to further finishing operations, such as shrinking, heat setting, molding, coating, impregnating and the like.

⁵ It should be noted that the Examiner now refers even more incorrectly to “stitch bonding,” not “stitch welding” – inductive or otherwise.

Among the conventional stitching threads that have been employed in stitchbonding operations are yarns of natural fibers (e.g., cotton, wool); fibers or filaments of fully drawn, crystalline polymers (e.g., nylon, polyester); fibers of partially molecularly oriented synthetic organic polymer; and threads of spandex, or of other elastic or elastomeric materials. Use of elastic stitching thread, with or without an accompanying non-elastic thread, is disclosed in several patents. Similar use of stitching thread that is shrinkable also has been disclosed. For example, Zafiroglu, U.S. Pat. Nos. 4,876,128, 4,773,238, 4,737,394 and 4,704,321 disclose processes for making bulky and/or stretchy stitchbonded fabrics with various contractible and conventional threads. According to the processes disclosed in these patents, the stitchbonded fabric, upon removal from the multi-needle stitching operation, is allowed or caused to shrink and gather and undergo a significant reduction in fabric area.

With respect to its contribution to the art, Tsiarkezos summarizes as follows (column 2, lines 3-31, emphasis added):

The present invention provides an improved stitchbonded nonwoven fabric. The fabric is of the type that comprises a material into which a pattern of multi-needle stitching had been inserted with a contractible stitching thread and then, the thusly formed stitchbonded fabric was contracted. **The improvement of the invention comprises the material comprising a non-fibrous layer of polymer, metal or leather.** Preferably the polymeric or metallic layer is a film, a coating or a foil. Typically, the stitched material, with its non-fibrous layer, contracts to a length and/or width that is 90% or less than the original length and/or width of the thin layer. Contractions to a length and/or width in the range of 50 to 75% of the original dimension are preferred. Preferably, the starting thickness of the non-fibrous layer is in the range of 0.05 and 3 mm. The non-fibrous layer may be united with a nonwoven fibrous sheet, a knitted fabric, a woven fabric, or a partially (surface) or fully resin-impregnated nonwoven fibrous sheet, to form a composite material into which the pattern of multi-needle stitches is inserted.

The invention also includes a process for making the new stitchbonded fabrics. The process is of the type that includes feeding a material to a stitchbonding machine having at least one multi-needle stitching bar, threading a needle bar with contractible stitching thread, inserting a pattern of stitches with the threaded multi-needle stitching bar into the material to form a stitchbonded nonwoven fabric and subsequently contracting the thusly formed stitchbonded fabric. According to the improvement of the process of the invention, the material comprises a non-fibrous layer of polymer, metal or leather or is a nonwoven fibrous sheet, knitted fabric, woven fabric, or a partially (surface) or fully resin-impregnated nonwoven fibrous sheet, which is coated, bonded or united with such a non-fibrous layer.

The rest of Tsiarkezos' disclosure is consistent with that summary.

In short, it is clear that Tsiarkezos is completely inapposite to inductive stitch welding. (In fact, none of the terms “weld,” “inductive,” and “induction” appears anywhere in that reference at all.) Nor is Tsiarkezos relevant to forming laminated structures either. Thus, the combination of references does not yield the claimed invention; the Examiner has failed to set forth a *prima facie* case of obviousness; and Applicants traverse the rejection and request that it be withdrawn.

Claims 34, 44, and 45 are rejected under 35 U.S.C. § 103(a) based on Anderson in view of Sobolev as applied against claim 27 and further in view of Otomine et al., U.S. 4,142,929, on which the Examiner relies for disclosure of 1) silk-screening an adhesive layer and 2) transferring fibers from a carrier to a cover sheet then removing the carrier sheet. Those three claims depend either directly or indirectly from independent claim 27. Accordingly, Applicants traverse the rejection for at least the reasons set forth above with respect to claim 27 since Otomine does not remedy the deficiency of the base combination of references, and Applicants request that the rejection be withdrawn.

Claims 36 and 37 are rejected under 35 U.S.C. § 103(a) based on Sobolev as applied against claim 33 and further in view of Gregorian et al, U.S. 4,035,532, on which the Examiner relies for disclosure of using a foamed adhesive, applied substantially in dots. To the extent claim 37 is cancelled, the rejection is moot. On the other hand, claim 36 depends from independent claim 33. Accordingly, Applicants traverse the rejection for at least the reasons set forth above with respect to claim 33 since Gregorian does not remedy the deficiency of Sobolev as an anticipation reference, and Applicants request that the rejection be withdrawn.

Claim 39 is rejected under 35 U.S.C. § 103(a) based on Anderson in view of Sobolev as applied against claim 27 and further in view of Gregorian, on which the Examiner relies for disclosure of using a foamed adhesive, applied substantially in dots. Claim 39 depends from independent claim 27. Accordingly, Applicants traverse the rejection for at least the reasons set forth above with respect to claim 27 since Gregorian does not remedy the deficiency of the base combination of references, and Applicants request that the rejection be withdrawn.

Claim 41 is rejected under 35 U.S.C. § 103(a) based on Anderson in view of Sobolev as applied against claim 27 and further in view of Abrams et al., U.S. 5,858,156, on which the Examiner relies for disclosure of applying fibers in the form of a positive/negative pattern onto a cover sheet. Claim 41 depends from independent claim 27. Accordingly, Applicants traverse the rejection for at least the reasons set forth above with respect to claim 27 since Abrams does not remedy the deficiency of the base combination of references, and Applicants request that the rejection be withdrawn.⁶

Claim 42 is rejected under 35 U.S.C. § 103(a) based on Anderson in view of Sobolev as applied against claim 27 and further in view of Meseck, U.S. 3,975,222, on which the Examiner relies for disclosure of directing a steady or swirled stream of air onto the fibers in order to obtain an inordinate orientation of the fibers. Claim 42 depends from independent claim 27. Accordingly, Applicants traverse the rejection for at least the reasons set forth above with respect to claim 27 since Meseck does not remedy the deficiency of the base combination of references, and Applicants request that the rejection be withdrawn.

Claim 43 is rejected under 35 U.S.C. § 103(a) based on Anderson '637 in view of Sobolev as applied against claim 27 and further in view of Anderson, U.S. 3,616,007, on which the Examiner relies for disclosure of pre-curing and final curing of an adhesive layer. Claim 43 depends from independent claim 27. Accordingly, Applicants traverse the rejection for at least the reasons set forth above with respect to claim 27 since Meseck does not remedy the deficiency of the base combination of references, and Applicants request that the rejection be withdrawn.

⁶ Applicants also note that the application explains that “[i]n order to achieve a positive/negative pattern, templates (not shown) can be used for flocking, with which on one of the cover sheets a pattern in the form of flocked areas is generated which represents the negative pattern (non flocked areas) of the pattern on the other cover sheet so that these mutually complete each other upon joining the cover sheets together.” See paragraph [81]. Thus, the Examiner’s statement that “Abrams et al. teach electrodepositing flock by passing a sheet between potentials of a high voltage electrostatic field, and an electrode is used to give flock a charge and become aligned with the electrical field lines of force[.]” evidences a lack of understanding of the claimed subject matter and/or a failure to interpret the claims in light of the specification as required.

Claim 48 is rejected under 35 U.S.C. § 103(a) based on Sobolev as applied against claim 46 (now cancelled) in view of Otomine, on which the Examiner relies for disclosure of applying adhesive in the various claim-recited shapes. Claim 48 is amended to depend from independent claim 27. Accordingly, Applicants traverse the rejection for at least the reasons set forth above with respect to claim 27 since Otomine does not remedy the deficiency of the base combination of references, and Applicants request that the rejection be withdrawn.

Claim 49 is rejected under 35 U.S.C. § 103(a) based on Anderson in view of Sobolev as applied against claim 27, with the Examiner asserting that the features recited in claim 49 would have been obvious from routine experimentation, reference to “standard technical literature,” or “consultation with industrial or specialty adhesive suppliers.” Claim 49 depends from independent claim 27. Accordingly, Applicants traverse the rejection for at least the reasons set forth above with respect to claim 27, and Applicants request that the rejection be withdrawn.

In view of the foregoing, Applicants submit that all remaining claims are in condition for allowance, and timely Notice to that effect is respectfully requested.

The undersigned representative requests any extension of time that may be deemed necessary to further the prosecution of this application.

The undersigned representative authorizes the Commissioner to charge any additional fees under 37 C.F.R. 1.16 or 1.17 that may be required, or credit any overpayment, to Deposit Account No. 14-1437, referencing Attorney Docket No.: 7589.207.PCUS00.

In order to facilitate the resolution of any issues or questions presented by this paper, the Examiner may directly contact the undersigned by phone to further the discussion.

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